PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Shoji HARA *et al.*

Appln. No.: 09/782,169 Group Art Unit: 1762

Filed: February 14, 2001 Examiner: Brian K. Talbot

For: Laminate Comprising Polyimide and Conductor Layer, Multi-Layer Wiring Board with the Use of the Same and Process for Producing the Same

DECLARATION

Assistant Commissioner of Patents
Washington, D.C. 20231

Sir/Madam:

I, Masaru NISHINAKA, do declare and state that:

I conducted Example 2 as follows.

The following experiment was conducted by me or my direct supervision in order to demonstrate the superiority of the present invention.

Example 2

Under cooling the whole system with ice/water, 123.1 g of BAPP was introduced into a 2000 ml three-necked separable flask having been purged with nitrogen by using 716.2 g of DMF. After stirring for 15 minutes, 33.8 g of BTDA was added thereto by using 20 g of DMF. Subsequently, 76.0 g of TMEG was added thereto by using 20 g of DMF and the resultant mixture was stirred for 30 minutes. After stirring for 30 minutes, 4.1 g of additional TMEG dissolved in 36.9 g of DMF was slowly added while paying attention to the viscosity of the contents of the flask. Then the reaction mixture was allowed to stand for 1 hour under stirring to thereby give a polyamic acid solution. Separately, a 17% by weight solution of a polyamic acid, which had been

synthesized by using pyromellitic dianhydride/p-phenylene(trimellitic acid monoester acid anhydride)/p-phenylenediamine/4,4'-diaminodiphenyl ether at a molar ratio of 5/5/4/6, in DMF was defoamed by centrifugation and then cast on an aluminum foil to give a final thickness of 17 μm. This laminate comprising the aluminum foil and the polyamic acid solution was heated to 110°C for 4 minutes to thereby give a self-supporting gel film. This gel film was immersed in the polyamic acid solution (i.e., the precursor of a thermoplastic polyimide) prepared above. After eliminating the excessive polyamic acid so as to give the final thickness in one face of the thermoplastic polyimide layer of 4 μm, the laminate was heated to 150°C, 200°C, 250°C, 300°C and 350°C each for 1 minute to thereby give bonding sheets of 25 μm in total thickness. By using these bonding sheets, samples were prepared as in Example 1 but the heating treatment after allowing to stand at room temperature for 4 days was carried out at two different temperatures, i.e., 170°C and 220°C. Next, a pattern (3 mm in width) for measuring the peel strength was formed as in Example 1 and the peel strength was measured. Table 2 summarizes the measurement results.

[Table 2]

	Heating temp. (°C)	Peel strength (N/cm)
Ex. 2	170	4.2
	220	4.4
Comp. Ex. 2	no	1.8

I d clare further that all statements mad herein of my own knowledge are tru and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, at Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date : 26th. December, 2002 Name : Masaru Nishinaka

Masaru NISHINAKA